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(71) Applicant(s)
Electrodrives Limited
(Incorporated in the United Kingdom)
Btr House, Carlisle Place, LONDON, SW1P 1BX,
United Kingdom

(72) Inventor(s)
Stephen Paul Hurley

(74) Agent and/or Address for Service
Invensys plc
Invensys Intellectual Property, P.O. Box 8433,
REDDITCH, B98 0DW, United Kingdom

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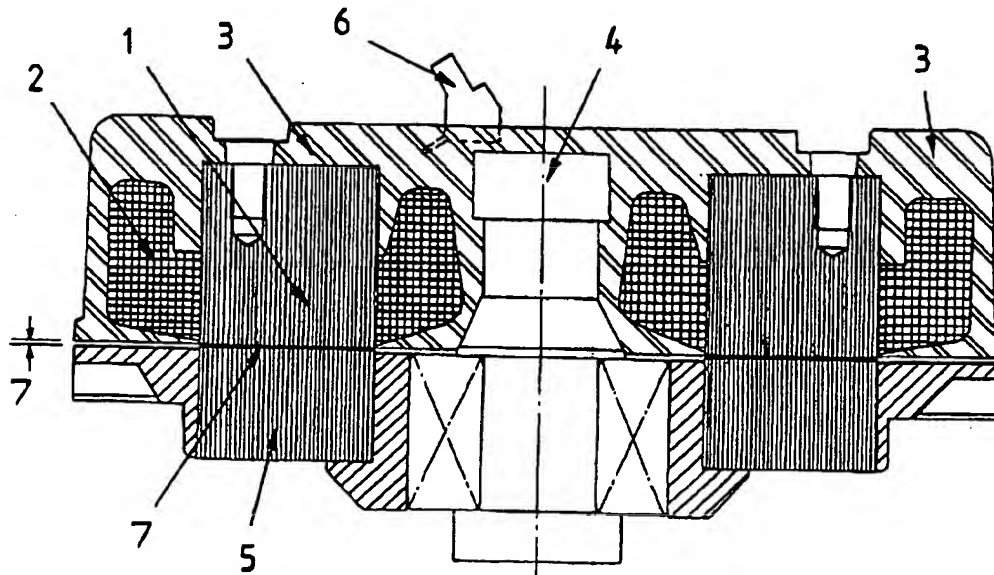
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AR216S AR220S AR303B AR305B AR402

(56) Documents Cited
EP 0807644 A1 WO 96/31938 A1 US 5672927 A
US 4568862 A US 4387311 A
WPI Abstract & FR002593432A (Jacoblac)

(58) Field of Search
UK CL (Edition Q) H2A AKB2 AKB4A AKB4B AKH1
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(54) Abstract Title
Motor with encapsulated stator

(57) An axial airgap motor comprises a stator encapsulated within a hardenable electrically insulating material 3. The connector block 6 is partially embedded and the coil winding is directly connected to the block within the moulding compound which may be a glass polyester dough moulding compound.



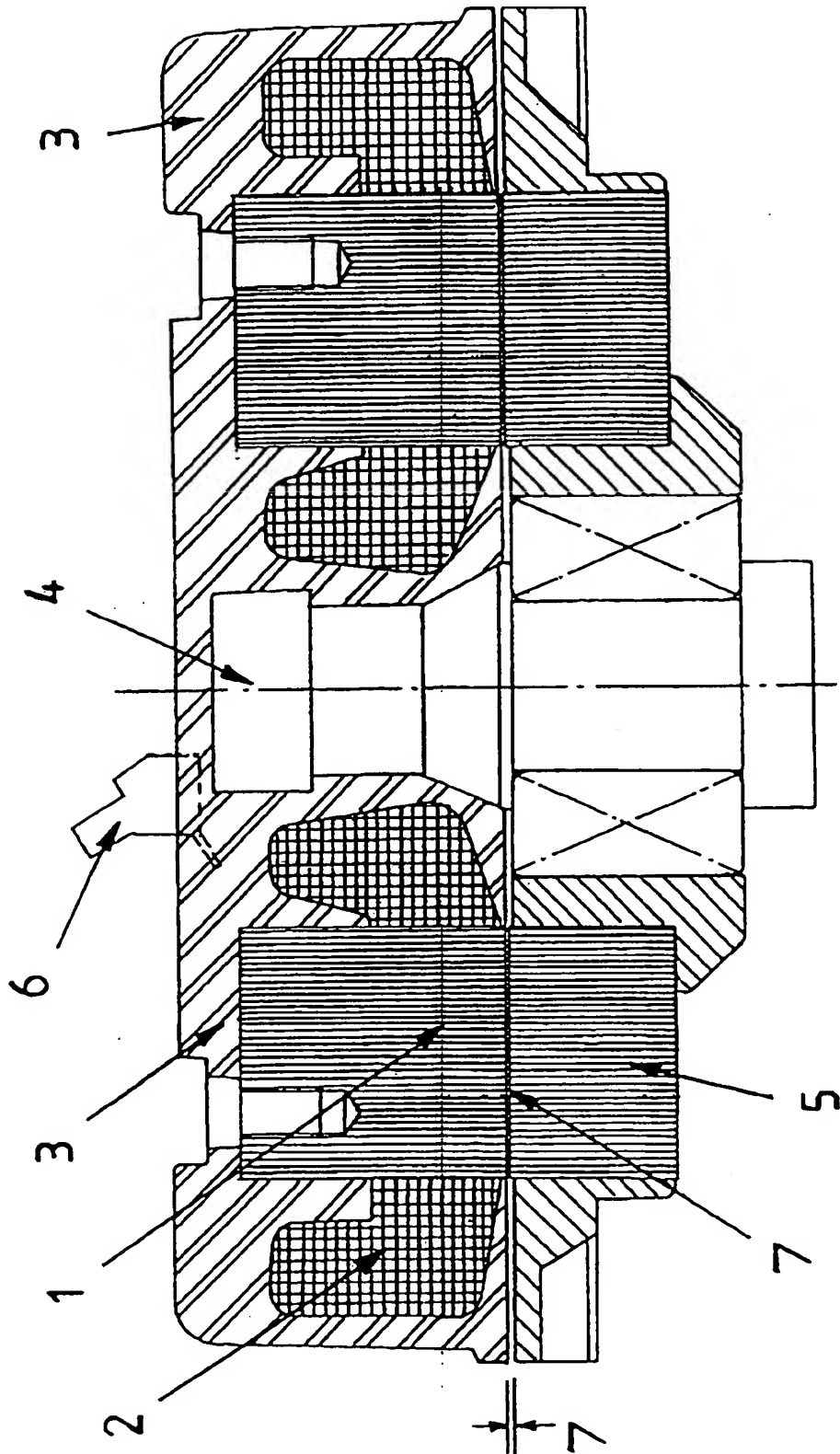
At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

The claims were filed later than the filing date but within the period prescribed by Rule 25(1) of the Patents Rules 1995.

2/18/05, EAST Version: 2.0.1.4

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MOTOR

Disclosed herein are improvements in and relating to motors and more particularly so-called axial airgap (AAG) motors. Also known as "axial flux motors".

It is an object of the present invention to provide a less expensive construction which provides enhanced weatherproofing of the motor.

In accordance with the invention an axial airgap motor has a stator encapsulated by or encased within a hardenable electrically insulating material. The hardenable material is preferably a glass reinforced polyester dough moulding compound. As well as a requirement to provide electrical insulation (secondary to the usual insulation of the winding wires), the selection of a suitable insulating material can take account of thermal energy transfer requirements, for example to provide a heat conduction path better than that afforded by an airgap.

One embodiment of the invention is shown by way of example only in the attached drawing which shows a longitudinal cross-section of a moulded axial airgap motor.

The disc shaped stator of the axial airgap motor 1 and its winding 2 are encapsulated by or encased within a structure formed by glass reinforced polyester dough moulding compound 3. Such a structure may be formed by a suitable moulding process.

The shaft 4 on to which the rotor 5 will be fitted is moulded into position. The rotor 5 is finished by a machining process and similarly the moulded stator assembly is machined to ensure that in the resulting assembled motor 1 the axial airgap 7 has parallel sides. The width of the airgap 7 is set during assembly of the motor.

The electrical connections for the motor have to exit the moulding, and one way of doing this is, as shown in the drawings, by use of a special purpose connecting device 6 which is embedded part above and part below the surface of the moulding 3. Thus the wound stator plus the connecting block and shaft preform are inserts to the moulding process and the complete moulding

assembly is the "output" which then goes on to subsequent machining and assembly operations.

The provision of the stator structure by moulding in dough moulding compound is overall a less expensive method of manufacture than achieving the same by metal components which typically require casting, fettling, machining, surface treatment and/or assembly. The introduction of the special purpose connecting block with wires from the winding coils connecting directly to it beneath the surface of the dough moulding compound eliminates the need for inter-connecting leads and simplifies the connecting process which is one of the most labour intensive stages of motor manufacture at the present time.

The dough moulding compound structure provides the isolation from conducting parts and protection from ingress normally afforded by a metal enclosure, but to a greater extent. Thus a lower cost of manufacture and enhanced weatherproofing is achieved.

CLAIMS:

- 1 An axial airgap motor comprising a stator encapsulated by or encased within a hardenable electrically insulating material.
- 2 An axial airgap motor according to Claim 1 wherein the hardenable material is a polyester dough moulding compound.
- 3 An axial airgap motor according to Claim 2 wherein the hardenable material is glass reinforced.
- 4 An axial airgap motor according to any one of the preceding claims comprising a shaft on which a rotor may be fitted and moulded into the insulating material.
- 5 An axial airgap motor according to any one of the preceding claims comprising a connecting device partly embedded within the insulating material and through which electrical connections pass.
- 6 An axial airgap motor substantially as described herein with reference to, and as illustrated in, the accompanying drawing.



Application No: GB 9821797.9
Claims searched: 1-6

Examiner: John Cockitt
Date of search: 26 February 1999

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.Q): H2A [AKB2, AKB4A, AKB4B, AKH1, AKX3A]

Int Cl (Ed.6): H02K [15/10, 15/12, 05/08, 1/04]

Other: ONLINE: EPODOC, WPI, PAJ

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
X Y	EP0807644A1 MATSUSHITA - see whole document	1-3 4,5
Y	WO96/31936A1 EI DU PONT - see whole document	1-3,5
Y	US5672927A QUANTUM - shaft integral with stator base (example only)	4
X	US4568862A MAVILOR - see embedded stator - fig3	1 at least
Y	US4387311A HITACHI - see whole document	1-3,5
Y	WPI Abstract & FR002593432A (JACOBIAC) 31-07-87 (see abstract(s))	5

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.